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Dated: May 31, 2011
Electronic Signature for Matthew T. Fagan: /Matthew T. Fagan/

Docket No.: MWS-111RCE3
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Joseph F. Hicklin *et al.*

Application No.: 10/783,552 | Confirmation No.: 7454

Filed: February 20, 2004 | Art Unit: 1631

For: METHOD AND APPARATUS FOR IMPROVED MODELING OF CHEMICAL AND BIOCHEMICAL REACTIONS | Examiner: K. R. Skowronek

ARGUMENTS SUBMITTED IN CONJUNCTION WITH PREAPPEAL BRIEF REQUEST FOR REVIEW

MS Appeal
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

The following is submitted together with a Notice of Appeal under 37 C.F.R. §41.31 and in support of a Pre-Appeal Brief Request for Review in the above-identified Application.

In the February 28, 2011 Office Action (hereafter the "Office Action"), claims 1-5, 8-11, 14-17, 20-23, 26-29, and 32-35 were rejected under 35 U.S.C. §103(a) as being unpatentable over Sauro et al., Omics: A Journal of Integrative Biology, Vol. 7, No. 4, 2003 (hereafter "Sauro") in view of Kurata et al., Nucleic Acids Research, Vol. 31, No. 14, p.4071-4084, 2003 (hereafter "Kurata") in view of Funhashi et al., Biosilico, Vol. 1 No. 3, pp. 159-162, November 2003 (hereafter "Funhashi") and further in view of International Application Publication No. WO 96/22575 to Thalhammer-Reyo (hereafter "Thalhammer-Reyo") (See the Office Action, pages 4-5). Furthermore, claims 37-39 was rejected under 35 U.S.C. §103(a) as being unpatentable over Sauro, Kurata, Funhashi, and Thalhammer-Reyo, and further in view of Shannon et al., Genome research, Vol. 13, p. 2498-2504, 2003 (hereafter "Shannon") and in view of *Presentation of Biospice*, DARPA BioComp, May 2002 (hereafter "Biospice"). Applicants respectfully traverse the rejection.

Applicants respectfully urge that Sauro, Kurata, Funhashi, and Thalhammer-Reyo, alone or in any reasonable combination, do not disclose or suggest at least ***using the output of a simulation engine to control a property of an experiment*** where ***the output represents the dynamic behavior of the biological system at a completion of the simulation***, which is present in claim 1. Claims 8, 14, 20, 26, and 32 each include similar features.

With respect to claims 1-5, 8-11, 14-17, 20-23, 26-29, and 32-35, Applicants note that each of independent claims 1, 8, 14, 20, 26, and 32 respectively describe that a simulation of a system, process, or reaction is conducted until the occurrence of a predefined simulation termination condition. Upon the occurrence of the predefined simulation termination condition, the simulation terminates and generates, as an output, dynamic behavior of the system, process, or reaction. In addition, data acquisition hardware may gather data from an experiment. The output may be used to control a property of the experiment or, if the experiment and simulation do not agree, to provide an indication of the disagreement.

One distinction between the present application and the cited references is the timing represented by the output of the simulation. For example, in claim 1, the output represents the dynamic behavior of the biological system ***at a completion of the simulation*** . In contrast, the cited references address the use of ongoing simulation data to control an ongoing experiment, where the output represents behavior before the completion of a simulation. As will be discussed in more detail below, the cited references do not disclose or suggest using the output of a simulation representing dynamic behavior at a completion of the simulation, and one of ordinary skill in the art would not modify the references to use the output at completion.

I. Sauro, Kurata, Funhashi, and Thalhammer-Reyo, alone or in any reasonable combination, do not disclose or suggest that *the output represents the dynamic behavior of the biological system at a completion of the simulation*

Applicants have argued that Sauro, Kurata, and Funhashi, alone or in combination, do not disclose or suggest ***using the output of the simulation engine to control a property of the experiment*** where ***the output represents the dynamic behavior of the biological system at a completion of the simulation***. See Applicants' June 16, 2010 Response at pages 11-12. The Examiner does not dispute this argument in the Office Action. Instead, the Examiner argues that

Thalhammer-Reyo discloses this feature. Applicants respectfully disagree. Specifically, the information that Thalhammer-Reyo uses is gathered at the wrong time.

In contrast to the present claims, which (for example) carry out a simulation to completion and then use the results of the simulation to influence an experiment, Thalhammer-Reyo is limited to maintaining a 1:1 correspondence between an ongoing simulation and an ongoing experiment. See Thalhammer-Reyo at paragraph 4, page 10. This requires that the results of the ongoing simulation (i.e., before completion) be used to influence the experiment. Thus, Thalhammer-Reyo does not disclose or suggest ***using the output of a simulation engine to control a property of an experiment*** where ***the output represents the dynamic behavior of the biological system at a completion of the simulation***, which is present in claim 1, nor the corresponding features in the remaining claims.

In the present Office Action, the Examiner argues that "the phrase 'a completion of the simulation' and a 'conclusion of an experiment' are broadly interpreted to be directed to not only the last measurement of an experiment or the last value of a simulation, but also include measurements taken from ongoing experiments and values generated by ongoing simulations." See Office Action, pages 8-9, emphasis added. Applicants respectfully disagree with the Examiner's characterization of the claim terms.

Although the Examiner is entitled to give claim terms their broadest reasonable interpretation, the interpretation assigned to the claim term "at a ***completion*** of the simulation" and "at a ***conclusion*** of the experiment" is not reasonable. In this case, the Examiner has interpreted the claims, which explicitly note that the output in question represents a behavior at a completion or a conclusion of an experiment or simulation, to include values generated before an experiment has concluded or a simulation is complete. This is despite the fact that the present claims include that the simulation or experiment is carried out until a defined ***termination condition***, which describes when the simulation or experiment ceases. There is no reasonable interpretation where "the output of the simulation before completion of the simulation" means "the output of the simulation at completion of the simulation."

Indeed, the example described at page 9 of the Office Action references the output of a time course simulation which, the Examiner specifically notes, is generated before the

conclusion of the simulation. This is the opposite of what occurs in the present claims. Accordingly, Thalhammer-Reyo, alone or in any reasonable combination with the other cited references, fails to disclose ***using the output of a simulation engine to control a property of an experiment*** where ***the output represents the dynamic behavior of the biological system at a completion of the simulation.***

II. One of ordinary skill in the art would not modify Thalhammer-Reyo to use the output at the conclusion of the simulation as described in the present claims

Furthermore, one of ordinary skill in the art would not modify Thalhammer-Reyo to use the output at the conclusion of the simulation, because Thalhammer-Reyo's purpose is to monitor an ongoing experiment with reference to an ongoing simulation and correct the ongoing experiment if, for example, the experiment begins to deviate from the simulation. See, e.g., Thalhammer-Reyo at paragraph 4, pages 9-10. Accordingly, once the experiment or simulation is complete, there is no further need in Thalhammer-Reyo to produce any further output, much less use further output to control the (now completed) experiment.

One of ordinary skill in the art would not be motivated to modify Thalhammer-Reyo to use the results of a simulation after completion because, if the simulation is run to completion before results are consulted and compared to the ongoing experiment, it will be too late to take action to correct the ongoing experiment. Accordingly, modifying Thalhammer-Reyo to use the results of an experiment or simulation after the experiment or simulation has completed would impermissibly render Thalhammer-Reyo unsatisfactory for its intended purpose. See MPEP at §2145.X.D; see also Applicants' December 13, 2010 Response at pages 12-14 for an in-depth analysis of Thalhammer-Reyo and why one of ordinary skill in the art would not modify Thalhammer-Reyo to arrive at the presently claimed invention.

Claims 8, 14, 20, 26, and 32 are similar to claim 1, but include a simulation of a model of a biological process or a chemical reaction (rather than a simulation of a model of a biological system as in claim 1). Applicants respectfully urge that the cited references do not disclose or suggest the features of claims 8, 14, 20, 26, and 32 for at least the reasons discussed above with respect to claim 1.

For at least the reasons set forth above, Applicants respectfully urge that Sauro, Kurata, Funhashi, and Thalhammer-Reyo do not disclose or suggest each and every feature of claims 1-5, 8-11, 14-17, 20-23, 26-29, and 32-35. Therefore, Applicants respectfully request that the above §103 rejection be reconsidered and withdrawn.

III. With respect to claims 37-39, the addition of Shannon and Biospice fails to cure the factual deficiencies of Sauro, Kurata, Funhashi, and Thalhammer-Reyo with regards to the timing of the output

With respect to claims 37-39, which stand rejected under 35 U.S.C. §103(a) as being unpatentable over Sauro in view of Kurata, Funhashi, and Thalhammer-Reyo, and further in view of Shannon, and BioSpice, Applicants respectfully traverse this rejection.

Claim 37 depends from claim 1; claim 38 depends from claim 8, and claim 39 depends from claim 14. As noted above, Sauro, Kurata, Funhashi, and Thalhammer-Reyo do not disclose or suggest all the features of claims 1, 8 and 14. The addition of Shannon and BioSpice fails to cure the factual deficiencies of Sauro, Kurata, Funhashi, and Thalhammer-Reyo with respect to disclosing or suggesting the above-noted features of claims 1, 8, and 14.

The Examiner does not allege that either Shannon or Biospice disclose the above-noted features of the claims. Because Shannon and Biospice fail to cure the factual deficiencies of Sauro, Kurata, Funhashi, and Thalhammer-Reyo (see December 13, 2010 Office Action at pages 18-20), Applicants respectfully request that the above §103 rejections of claims 37-39 be reconsidered and withdrawn.

Dated: May 31, 2011

Respectfully submitted,

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